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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/536,347 03/27/00 BAILEY

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022434 IM52/0921  
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EXAMINER

ALEJANDRO MUIERO, L.

ART UNIT

PAPER NUMBER

1763  
DATE MAILED:

09/21/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

# Office Action Summary

Application No.

09/536,347

Applicant(s)

BAILEY, ANDREW D.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 17-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-25 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 and 2 6) ☐ Other: \_\_\_\_

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## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-16, drawn to an apparatus, classified in class 118, subclass 723MA.
- II. Claims 17-25, drawn to a method, classified in class 438, subclass 728.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as a method in which no magnetic field is generated.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

During a telephone conversation with Michael lee on 09/10/01 a provisional election was made with traverse to prosecute the invention of group I, claims 1-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Dandl, U.S. Patent 5,707,452.

Dandl shows the invention as claimed including a plasma processing apparatus for processing a substrate 80 comprising: a wall 78 defining part of the process chamber; and a device 54 for igniting and sustaining within the process chamber a plasma for the processing; and a magnetic array having a plurality of magnetic elements 14, 30, 32, 34 and 88, that are disposed within the process chamber, the plurality of elements being configured to produce a magnetic field (see fig. 2 and its description).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dandl, U.S. Patent 5,707,452.

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Dandl is applied as above but lacks anticipation of showing that the substrate support is a chuck, but the examiner takes official that such means is well known and used in the art for securely supporting and holding substrates in the processing chamber, and its inclusion in the apparatus disclosed by the Dandl reference would be prima facie obvious.

Dandl further discloses that the support 84 for the substrate is spaced apart from a first end of the processing chamber, the plasma is ignited in a region between the first end of the process chamber and the support, and wherein plurality of the magnetic elements are disposed around and extend along the plasma region (substantially from the first end of the processing chamber to the substrate support), the magnetic field has an azimuthally symmetric radial gradient, each magnetic element has a physical axis which extends along the plasma region, each magnetic element has a magnetic axis which is substantially perpendicular to the physical axis, and wherein the magnetic elements are permanent magnets.

Claims 8, 10-11, 13, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dandl, U.S. Patent 5,707,452 as applied to claims 2-7 and 12 above, and further in view of Shan et al., U.S. Patent 6,113,731.

Dandl does not expressly disclose that the magnetic elements are electromagnets and their rotation to shift the magnetic field over time. Shan et al. discloses the use of electromagnets for generating an electronically rotated magnetic field in order to reduce damage of the substrate being processed and increase radial uniformity of the plasma process being performed on the substrate (see col. 4, lines 45-

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58; col. 5, lines 1-5; col. 6, lines 51-65; and col. 11-line 65 to col. 12-line 16). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by the Dandl reference as to comprise electromagnets as the magnetic elements and as to rotate them to shift the magnetic field over time as to optimize the process being performed in the apparatus by reducing the damage of the substrate being processed and increasing radial uniformity of the plasma process being performed on the substrate. Moreover, note that Shan et al. further disclosed that the electromagnets can be replaced by permanent magnets (see col. 9, lines 50-67, and col. 11-line 65 to col. 12-line 16). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use electromagnets in the apparatus of Dandl because there is not evidence that the choice of a particular magnetic element would significantly affect the overall performance of the plasma processing apparatus.

Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dandl, U.S. Patent 5,707,452 as applied to claims 2-7 and 12 above, and further in view of Ye et al., U.S. Patent 6,178,920 B1.

Dandl does not expressly disclose that the magnetic elements are individually contained within sleeves. Ye et al. disclose magnetic elements contained in a non-sputtering jacket to prevent plasma within the processing chamber from sputtering underlying material into the processing chamber (see col. 3-line 54 to col. 4-line 11; figs. 2A, 7A and 9C, and their descriptions). Therefore, it would have been obvious to one

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having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by the Dandl reference as to further comprise magnetic elements individually contained within sleeves as to reduce contamination of the substrate and the processing chamber as taught by Ye et al.

Claims 10-11 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dandl, U.S. Patent 5,707,452 as applied to claims 2-7 and 12 above, and further in view of Tan et al., U.S. Patent 5,795,451.

Dandl does not expressly disclose that the magnetic elements rotate to shift the magnetic field over time. Tan et al. discloses the use of magnetic elements for which are rotated to shift the magnetic field over time in order for a more uniform processing of the substrate, therefore improving the substrate being processed (see col. 1, lines 43-52; and col. 3, lines 9-15. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by the Dandl reference by comprising a mechanically rotated magnetic elements assembly in order to shift the magnetic field over time for optimizing the substrate being processed and the process being performed in the apparatus by reducing the damage of the substrate due to a more uniform processing of the substrate.

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***Specification***

The abstract of the disclosure is objected to because the abstract should be limited to a **single paragraph** on a separate sheet within the range of 50 to 250 words. Correction is required. See MPEP § 608.01(b).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



LLAM  
September 18, 2001



GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700